

DRISI

CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

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Research

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Maintenance

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Project Title:
Evaluation of Remote Operation of
Truck-Mounted Attenuator (TMA)-
Equipped Shadow Vehicles for Use in
Caltrans Operations

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Evaluation of Remote Operation of Truck-Mounted Attenuator (TMA)- Equipped Shadow Vehicles for Use in Caltrans Operations

To evaluate the performance of commercially available remote-control technologies, for the remote operation of truck-mounted attenuator (TMA)-equipped shadow vehicles.

WHAT IS THE NEED?

Caltrans highway maintenance and repair activities often require a shadow (trailing) truck equipped with a Truck Mounted Attenuator (TMA) to provide impact protection for workers from errant vehicles. The nature of shadow trucks, or TMA trucks, dictates that they will be hit by errant vehicles, so while the TMA truck increases safety for the workers, each collision still compromises the safety and well-being of the shadow truck driver. There is a need to remove Caltrans' shadow truck drivers from the risks associated with errant vehicle impacts. This is expected to reduce operator injuries due to public vehicle impacts with the TMA vehicles in highway work zones.

Recently available commercial off-the-shelf (COTS) systems can support remote operation from a distance for various vehicle types. The use of such a system would allow Caltrans to meet the needs to remove shadow truck drivers from the vehicle and achieve significant safety benefits. While a remote-control system can place vehicle driver in a safe working environment, it avoids the challenges and risks associated with automated TMAs and can be deployed in more complex settings involving busy highways.

WHAT ARE WE DOING?

In this project the contractor, Advanced Highway Maintenance and Construction Technology (AHMCT) research center, UC Davis will identify a vendor and system that provides the needed remote control of a shadow truck and work with the Caltrans Division of Equipment to identify a suitable shadow truck for hosting the remote-control instrumentation. AHMCT will then procure the remote-control system, monitor the vendor during



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installation of their system on the shadow truck's platform and observe final vendor certification of their commercial off-the-shelf (COTS) remote-control system. With these preliminary steps completed, AHMCT will then develop a test plan for this system and execute safety and performance tests on closed test tracks, leading to final evaluation and documentation of the research results.

WHAT IS OUR GOAL?

The purpose of this research project is to evaluate the performance of a commercial off the shelf remote control system for the remote operation of truck-mounted attenuator (TMA) vehicles.

WHAT IS THE BENEFIT?

This research project provides an opportunity to evaluate the performance of a remote-control system for the remote operation of truck-mounted attenuator (TMA) vehicles. The use of such a system would allow Caltrans to remove shadow truck drivers from the vehicle and achieve significant safety benefits.

WHAT IS THE PROGRESS TO DATE?

Kick-off meeting was held on February 1, 2023. Project panel meetings were held on May 2 & June 12, 2023. Contractor performed literature review, and identified several vendors who have relevant remote driving technologies. Contractor collected documentation of regulatory process for automated vehicle testing in California, including the Department of Motor Vehicles regulations. Contractor identified and contacted several vendors with relevant products for remote driving of a truck type vehicle and prepared overview of various vendors, their capabilities, and their capacity requirements to get involved in this project.

Panel meeting was held on August 7, 2023. Two potential vendors were identified for working on this project. Contractor also worked on the development of test plan/platform.

Panel meeting was held on February 13, 2024. Contractor updated the draft test plan. The research team plans to conduct the proof-of concept demonstration during June 2024 at Caltrans Maintenance Equipment Training Academy (META).